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REPORTING REQUIREMENTS FOR FISSIONABLE AND FERTILE SUBSTANCES

by

AECB staff

Atomic Energy Control Board
Ottawa, Canada

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Canada

FOREWORD

In accordance with the provisions of the Atomic Energy Control Act and the Regulations made thereunder, the Atomic Energy Control Board established a licensing system governing all dealings in nuclear materials including production, export, import, acquisition, shipment and use in the interest of health, safety and security.

In establishing its licensing system, the Board endeavoured to ensure that its requirements for records and reports on all dealings in nuclear materials were both consistent and uniformly applied. With the entry into force of the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) on March 5, 1970, the need for uniformity of the accountability records and reports prepared by Canadian licensees became even more important since these documents are subject to verification by inspectors of the International Atomic Energy Agency (IAEA) under the terms of a safeguards agreement concluded between Canada and the Agency on February 29, 1972.

The instructions set forth below for accountability records and reports on nuclear materials are intended to fulfill Canada's obligations under the NPT as well as the requirements of the Atomic Energy Control Act and Regulations. They have been prepared with a view to minimizing the effort required of licensees and to be compatible with electronic data processing. It should be noted that the information to be made available to IAEA inspectors will be limited to accountability data required for safeguards purposes. Information of a proprietary nature or involving questions of health and safety are not required to be made available to the IAEA under the terms of the safeguards agreement.

Ce document est aussi disponible en français.

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FOR

MATERIAL BALANCE AREAS (MBA)
MINE/MILL FACILITIES
UNACCOUNTABLE GAINS AND LOSSES (SLU)
COUNTRIES

A. GENERAL REPORTING REQUIREMENTS

1. Reports

The Atomic Energy Control Board requires all persons licensed to deal with group 1 or 2 substances to submit to the Board reports of material movements and possession as stipulated in this document unless otherwise required by the terms of the licence.

2. Definitions

2.1 Material Groups

Reporting requirements differ according to the type of material involved. For these reporting requirements the following groups have been defined.

2.1.1 Group 1

Natural and depleted uranium and thorium connected with the nuclear fuel cycle or in any unfinished form. Uranium having a greater percentage of the isotope ^{235}U than is normally found in nature, uranium isotope ^{233}U and plutonium.

2.1.2 Group 2

Natural and depleted uranium and thorium not connected with the nuclear fuel cycle and in a finished form. This group includes such things as counterweights, other cast, machined or clad forms, pottery pigments, alloys and incandescent mantles.

2.2 Other Definitions

The following definitions have been accepted for safeguards under the NPT and apply to the reports described in this document.

2.2.1 Material balance area (MBA)

Material balance area means an area in and outside of a facility such that:

(a) The quantity of nuclear material in each transfer into and out of each material balance area can be determined; and

(b) The physical inventory of nuclear material in each material balance area can be determined when necessary, in accordance with specified procedures,

in order that the material balance for Agency safeguards purposes can be established.

2.2.2 Key Measurement Point (KMP)

Key measurement point means a location where nuclear material appears in such a form that it may be measured to determine material flow or inventory. Key measurement points thus include, but are not limited to, the inputs and outputs (including measured discards) and storages in material balance areas.

2.2.3 Batch

Batch means a portion of nuclear material handled as a unit for accounting purposes at a key measurement point (KMP) and for which the composition and quantity are defined by a single set of specifications or measurements. The nuclear material may be in bulk form or contained in a number of separate items.

2.2.4 Batch Data

Batch data means the total weight of each element of nuclear material, and in the case of plutonium and uranium, the isotopic composition when appropriate. The units of account shall be as follows:

(a) Grams of contained plutonium;

(b) Grams of total uranium and grams of contained uranium-235 and uranium-233 for uranium enriched in these isotopes; and

(c) Kilograms of contained thorium, natural uranium or depleted uranium.

For reporting purposes, the weights of individual items in the batch shall be added together before rounding to the nearest unit.

Note that although the degree of accuracy is not specified and facilities are left to use whatever precision and accuracy they normally employ for contract purposes they must adhere to the units of account as defined above.

2.2.5 Facility Attachment

A Facility Attachment is part of the Subsidiary Arrangements to the "Agreement Between The Government Of Canada And The International Atomic Energy Agency For The Application Of Safeguards Pursuant To The Treaty On The Non-Proliferation Of Nuclear Weapons". The Facility Attachment specifies how the safeguards procedures laid down in the Agreement are to be applied at the facility.

3. Transfer Reports

3.1 Domestic Transfers

3.1.1 Unirradiated Material

All transfers of group 1 substances shall be reported in accordance with Part B of this document. In addition, a Monthly Summary Report of transfers shall be submitted in accordance with section 4 below.

3.1.2 Irradiated Material

In addition to the requirements of section 3.1.1 above, the shipper shall provide the following information for each transfer:

(a) the number of bundles and average burn-up in each batch;

(b) the total initial amount of source material* and fissile isotope** in each batch, based on fabricator's data;

(c) the calculated fissile isotope content in each bundle or batch as of the day of discharge from the reactor;

(d) on shipments for reprocessing the total ^{241}Pu decay during storage per bundle or per batch calculated as of the date of shipment or some other recent date.

3.2 International Transfers

3.2.1 Export

On shipment a transfer report shall be submitted by the shipper as per section 3.1.1 or 3.1.2 above.

3.2.2 Import

On receipt a transfer report shall be submitted by the receiver as per section 3.1.1 above, the transfer being assigned a transfer number from the receiver's shipping series (see Part B, section 4).

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*Source material is natural or depleted uranium or thorium.

**Fissile isotopes are plutonium, ^{235}U and ^{233}U but not ^{235}U present in natural or depleted uranium.

4. Monthly Summary Reports

4.1 Material Transfer Summaries

A monthly summary of the movements of group 1 material shall be reported in accordance with instructions in Part C of this document.

4.2 Reactor Spent Fuel Summaries

For spent fuel discharged within the monthly accounting period the operator shall provide the following information:

(a) the number of bundles and average burn-up;

(b) the total initial amount of source and fissile isotopes based on the fabricator's data;

(c) the final fissile isotope content.

This data is required for fuel that is permanently discharged but not for fuel that is temporarily discharged for shuffling or recycling back into the reactor. The operator may choose the method of calculating the final amount of fissile isotope but he should inform the AECB of the method used.

5. Other Reports

Any person receiving group 1 material and converting it to group 2 material shall acknowledge receipt on Form AECB 59 as specified in Part B of this document and submit an annual report as specified in Part C showing receipts, quantities converted to group 2 material and shipments.

Persons receiving only group 2 material are normally not required to submit regular reports to the Board. Manufacturers of group 2 material must receive confirmation from the Board that their product is not connected with the nuclear fuel cycle.

6. Physical Inventory Reports

Each material balance area is required to determine and report the physical inventory of nuclear material in its possession in accordance with Part D on a frequency stipulated in the appropriate Facility Attachment. The operator shall notify the Board at least 30 days in advance of a Physical Inventory Taking (PIT). This notification shall include a written procedure outlining the steps that will be taken to perform the inventory taking. Board officers may consult with the operator regarding verification steps to be taken into consideration such as provision of lift truck operators, laboratory personnel, calibration of balances etc.

B. PREPARATION OF THE NUCLEAR MATERIALS TRANSFER REPORT

1. Definition of Transfer

A transfer is an inventory change at a material balance area (MBA) or a mine/mill facility. The change could be the result of nuclear material arriving at or leaving the area. Unaccountable gains and losses of material shall be treated as transfers to and from the Unaccountable Gain or Loss Account (see APPENDIX C).

2. Reporting Transfers

All transfers are reported on the Nuclear Material Transfer Report Form AECB 59 (see APPENDIX A).

3. Initiation, Distribution and Acknowledgement of Form AECB 59 Transfer Reports

3.1 Domestic Transfers

3.1.1 Transfer reports shall be initiated by the shipper on the day of shipment and submitted to the Board and the receiver.

3.1.2 The receiver shall acknowledge receipt of the material by signing the transfer report on the day of receipt and submitting copies to the Board and the shipper.

3.2 Exports

3.2.1 The procedure for domestic transfers is recommended. If such an arrangement cannot be made the shipper shall proceed as in section 3.2.2 and 3.2.3 below.

3.2.2 The shipper shall initiate the transfer report and submit it to the Board. He may also submit copies to the foreign receiver at his discretion.

3.2.3 The shipper shall submit to the Board whatever acknowledgement of receipt is obtained from the foreign receiver.

3.3 Imports

3.3.1 The Canadian receiver shall initiate the transfer report on the day of receipt of the material and submit one copy to the Board.

4. Preparation of the transfer report Form AECB 59

The following instructions refer to the numbered blocks of Form AECB 59 R3/77. Shaded blocks on the form are for AECB use.

1. IAEA SAFEGUARDED

Indicate "No" if the material is known to be exempted or terminated from safeguards by the IAEA or if the material is known to be in an non-safeguarded form.

TRANSFER IDENTIFICATION

2. FROM

Enter the Reporting Identification Symbol (RIS)* of the shipper. (see APPENDIX C)

5. TO

Enter the RIS of the receiver. (see APPENDIX C)

8. SHIPPED

The shipper enters the date on which the material left his premises.

14. RECEIVED

The receiver enters the date on which the material entered his premises.

20. TRANSFER NUMBER

The first transfer report issued by a shipper shall be designated No. 1, each succeeding transfer report bearing a consecutively higher transfer number. This shall also apply to receipts of material from outside Canada (see section 3.3.1 above).

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*Reporting Identification Symbols are the codes given in APPENDIX C for material balance areas, countries, mine/mill facilities and unaccountable gains and losses.

27. REVISION

The revision number shall be 0 for each original transfer report. If an amendment, correction or revision of any kind is required, a new transfer report on Form AECB 59 shall be submitted bearing the identical TRANSFER IDENTIFICATION of the original but with the number 1 entered under REVISION. Further revision shall bear consecutively higher revision numbers.

28. EXPORT PERMIT NUMBER

The shipper enters the export permit number for transfers out of Canada.

36. IMPORT PERMIT NUMBER

The receiver enters the import licence number for transfers into Canada.

41. AECB CONTRACT NUMBER

The shipper enters the contract number assigned by the Uranium Export Review Panel for transfers out of Canada.

AECB

For AECB Use

46. TYPE

47. ICR TYPE

49. KMP

50. BASIS

51. NOTE

52. CONTINUATION

81. ICR NUMBER

85. ENTRY

SHIPPERS DATA

A separate line entry for each element in the shipment is entered. For example, a shipment of thorium oxide/plutonium oxide mixed fuel would require two line entries.

53. NUMBER OF ITEMS

Enter the number of containers or in the case of fabricated articles, the number of items.

57. MATERIAL DESCRIPTION

Enter a short description of the material eg. bundles, drums etc.

61. ELEMENT

Enter the applicable letter as indicated below:

Element	Code Letter
Natural uranium concentrate	C
Natural uranium	N
Depleted uranium	D
Uranium enriched in ^{235}U or ^{233}U	E
Plutonium	P
Thorium	T

NET WEIGHT

Enter the net weight

62. ELEMENT WEIGHT

Enter the weight in grams or kilograms as specified in Part A, section 2.2.4.

70. UNIT

Enter the units used in column 62.

PERCENT ISOTOPE

Enter the percent by weight of ^{235}U, ^{233}U or combination of these isotopes if the element is enriched uranium.

72. ISOTOPE WEIGHT

Enter the product of columns 62 and percent isotope in grams only.

80. ISOTOPE

Enter the applicable letter as indicated below:

Fissile Isotope	Code Letter
^{235}U only	G
^{233}U only	K
^{235}U and ^{233}U	J

SHIPPER / RECEIVER

NAME AND ADDRESS

Enter the full name and address of the shipper and receiver. These blocks are concerned with those who possess the material and not with ownership.

LICENCE NUMBER

The shipper enters the licence number of the Canadian receiver.

SIGNATURE

Enter the signature of an authorized employee.

RECEIVERS DECLARATION

SHIPPER'S WEIGHTS ACCEPTED

Enter a check mark if the material will not be measured. In this case the receiver accepts the responsibility to account for any material that may be missing.

MEASURED UPON RECEIPT

Enter a check mark if the material was measured upon receipt.

SUBJECT TO VERIFICATION

Enter a check mark if the material will be measured prior to the receiver accepting responsibility.

CHEMICAL AND PHYSICAL DESCRIPTION

Enter the chemical composition, such as UO_2, UF_6, etc., and the physical form such as drums of powder, fuel bundles, castings, etc.

OWNER

Enter the name of the owner.

FINAL DESTINATION

Enter the country of final destination.

EXPORTS

ENRICHMENT CONTRACT

For exports of natural UF_6 enter the enrichment contract number.

COUNTRY CONTROL NUMBER

Enter the USA country control number or country of origin for imports and exports.

5. Shipper/Receiver Differences

This is defined as the difference between the quantity of nuclear material in a batch as stated by the shipper and as measured by the receiver. If the two parties are able to reconcile the difference then the shipper shall issue and the receiver shall acknowledge a revision to the original transfer report. If the difference cannot be reconciled, the receiver shall post the shipper's weights to his accounts followed by a shipper/receiver difference (SRD) entry for the difference. Such SRDs shall also be included in the Monthly Summary Report.

6. Transfers of Unmeasured Quantities

If nuclear material is transferred before the quantity is established as is common with scrap returns to a processing plant, a preliminary estimate shall be made and reported as Shipper's Data. This quantity shall be included also in the Monthly Summary Report. The receiver shall acknowledge the AECB 59 transfer report with the stipulation that analysis will follow at a later date. When the final value is agreed between the shipper and receiver, a revision to the original transfer report shall be issued by the shipper and acknowledged by the receiver.

C. PREPARATION OF MONTHLY SUMMARY REPORTS

1. Reportable Quantities

Transfers of group 1 materials shall be reported regardless of quantity on a monthly basis according to the following instructions. The Monthly Summary Report shall be submitted by the 15th day of the following month. An illustrative format is included in APPENDIX B.

2. Monthly Summary Report

2.1 Licensee

Enter the full name of the reporting location.

2.2 MBA

Enter the MBA code.

2.3 Period

Indicate the period of time covered by the report.

2.4 Material

Indicate whether the report covers natural, depleted or enriched uranium, thorium, or plutonium.

2.5 Transfer Identification

Each transfer should be identified by the transfer and revision number of the AECB 59 transfer report, the MBA/RIS from and to and the date of the inventory change.

For entries not reported on AECB 59 forms, enter the MBA/RIS involved, and the date of inventory change.

2.6 Receipts and Shipments

Entries should be made in accordance with Part A, section 2.2.4.

2.7 Balance

Each report should show the beginning and ending balance.

3. Enriched Uranium

In addition to instructions 2.1 to 2.7 isotopic weight % and isotope weight is required for each batch. Beginning and ending balances shall include total U and total ^{235}U.

4. Group 2 Material Production Reports

All persons converting group 1 material to group 2 material must submit an annual report containing the information described in sections 2.1 to 2.7 above. If material is transferred from the facility in both group 1 and group 2 form (see Part A, section 2.1) a clear distinction must be made between the two groups of material in the report.

5. Computer Printout Reports

Computer printouts are welcome provided the information listed above is complete and decipherable.

D. PROCEDURE FOR PHYSICAL INVENTORY TAKING AND PREPARATION OF PHYSICAL INVENTORY LISTINGS AND MATERIAL BALANCE REPORTS

1. General Physical Inventory Taking (PIT) Procedures

It is the task of Agency and/or Board inspectors to verify a physical inventory taking which has been completed by the operator. The following is presented as a procedure which seems to be reasonably efficient and acceptable to both the Board and the Agency. Nothing in this procedure supersedes terms of the Agreement, nor does it preclude different approaches.

2. Safety

Nothing in the following procedure takes precedence over safety considerations.

3. Actions Taken Prior To The Physical Inventory Taking

3.1 The operator notifies the Board as far in advance as possible of the date of the physical inventory taking and provides the Board with a written procedure outlining the steps to be taken by the operator to perform the physical inventory taking (see Part A, section 6). Board officers may make arrangements for the operator to provide additional personnel or equipment for the verification.

3.2 All batches* in inventory are tagged by the operator with consecutively numbered tags. The most convenient form of tag is one which produces multiple copies of the information entered on the tag. One copy is collected and sorted by the operator to compile the Physical Inventory Listing (PIL) and the stub remains with the batch for identification and verification by the inspectors.

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* A single batch may contain only one type of material. One set of conversion factors should apply to all items in the batch. It is not permitted for example to group finished pellets, green pellets, a drum of ceramic UO_2 powder and a drum of scrap under one tag. This would constitute four batches and require four tags. Furthermore, all items in a batch must be physically grouped in the same location.

Data entered on the tags is as follows:

Physical inventory listing entry number - This is the tag number and is assigned to the inventory item by virtue of attaching the tag to it.

Batch identification - This is the identifying number of the pallet, drum, box or whatever which contains the batch.

Number of items - This may be 1 as in the case of a UF_6 cylinder or several as for a pallet with a number of pieces of metal on it.

Material description - This should include physical form and chemical composition. For example "natural UF_6" or "natural ceramic grade UO_2 powder" or "copper clad depleted U metal 2% molybdenum extrusions".

Gross weight - This usually includes container and supporting device such as pallets and is the most readily verifiable value.

Tare weight - Includes everything included in the gross weight except the nuclear material.

Net weight - Obtained by subtracting tare from gross weight.

Conversion factor - Used for calculating the contained U in the batch.

Enrichment - Weight percent ^{235}U if applicable.

Element weight - Total U, total Pu, total Th.

^{235}U weight - If applicable.

Key measurement point - the point, identified in the Facility Attachment at which the material was measured or estimated.

3.3 Immediately prior to the arrival of the inspection team the operator compiles the physical inventory listing (PIL) of tag data in a consecutively numbered sequence to avoid double counting or omissions.

The operator provides copies of the PIL to the inspectors for their use during the verification.

3.4 Facility books are brought up to date. If material flow is not stopped during the physical inventory taking and verification then last minute adjustments to the PIL and the operator's books may be required.

3.5 It is recommended that the facility stop the flow of material during the physical inventory taking and verification. If material flow is not stopped arrangements must be made to insure an accurate estimate of the material in-process.

4. Physical Inventory Verification (PIV)

4.1 Verification of the physical inventory usually follows the completion of the physical inventory taking by the operator. The AECB normally provides the facility with the names of the inspectors and the expected date of their arrival at the facility at least a week in advance of the inspection unless arrangements for unannounced inspection at the facility have been made.

4.2 An audit of the books is performed and the operator's book ending inventory is agreed to and recorded by the Agency, the AECB and the facility.

4.3 The inspection team select items from the PIL to be verified. Verification varies from simply observing the presence of an item to a complete measurement involving weighing, sampling and analysis. If numerous or large discrepancies are found the number of items verified is increased accordingly.

4.4 Notes indicating items checked, discrepancies in quantity, etc., are entered on facility, Agency and Board PIL sheets.

4.5 The operator's physical ending inventory is calculated taking into account any adjustments made to the PIL during the verification. The unresolved difference between the operator's physical and book ending is listed as an unaccountable gain or loss before the inspectors leave.

5. Following the Physical Inventory Verification

5.1 The operator forwards the adjusted PIL and the Monthly Summary Report covering the period from the previous month end to the physical inventory verification date to the AECB within 10 days after the verification is completed.

5.2 The next Monthly Summary Report, covering the period from the physical inventory verification date to the month end, is submitted with unaccountable gain or loss adjustments to bring the operator's book ending inventory into balance with the physical ending inventory that was verified by the AECB and IAEA.

5.3 Formal submissions of the Physical Inventory Listing and Material Balance Report (MBR) are made to the Agency by the Board within 30 days after the conclusion of the physical inventory verification.

APPENDIX A

NUCLEAR MATERIAL TRANSFER REPORT

FORM AECB 59 R3/77

ATOMIC ENERGY CONTROL BOARD
NUCLEAR MATERIAL TRANSFER REPORT

COMMISSION DE CONTRÔLE DE L'ÉNERGIE ATOMIQUE
RAPPORT DE TRANSFERT DES MATIÈRES NUCLÉAIRES

TRANSFER IDENTIFICATION / IDENTIFICATION DE TRANSFERT

IAEA SAFE-GUARDED / GARANTIES DE SÉCURITÉ		FROM / DE	TO / À	SHIPPED / EXPÉDIÉ LE			RECEIVED / REÇU LE			TRANSFER NUMBER / NUMÉRO DU TRANSFERT	REVISION	EXPORT PERMIT NUMBER / NUMÉRO DU PERMIS D'EXPORTATION	IMPORT PERMIT NUMBER / NUMÉRO DU PERMIS D'IMPORTATION	AECB CONTRACT NUMBER / NUMÉRO DU CONTRAT DE LA CCEA
YES / OUI	NO / NON	MBA/RIS	MBA/RIS	D - J	M	Y - A	D - J	M	Y - A					
1		2	5	8			14			20	27	28	36	41

AECB/CCEA

TYPE / GENRE	ICR TYPE / GENRE DE RVS	KMP	BASIS / BASE	NOTE	CONTINUATION
46	47	49	50	51	52

SHIPPERS DATA / DONNÉES DE L'EXPÉDITEUR

NUMBER OF ITEMS / NUMÉRO DES ITEMS	MATERIAL DESCRIPTION / DESCRIPTION DES MATIÈRES	ELEMENT	NET WEIGHT / POIDS NET	ELEMENT WEIGHT / POIDS DE L'ÉLÉMENT	UNIT / UNITÉ KG/G	PERCENT ISOTOPE / POURCENTAGE DE L'ISOTOPE	ISOTOPE WEIGHT / POIDS DE L'ISOTOPE	ISOTOPE
53	57	61		62	70		72	80

AECB/CCEA

ICR NUMBER / NUMÉRO DU RVS	ENTRY	LIGNE
81	85	

SHIPPER/EXPÉDITEUR (NAME AND ADDRESS/NOM ET ADRESSE)	RECEIVER/DESTINATAIRE (NAME AND ADDRESS/NOM ET ADRESSE)
	LICENCE NUMBER / NUMÉRO DU PERMIS :
SIGNATURE	SIGNATURE

CHEMICAL AND PHYSICAL DESCRIPTION
DESCRIPTION CHIMIQUE ET PHYSIQUE

OWNER/PROPRIETAIRE

FINAL DESTINATION/DESTINATION FINALE

EXPORTS/EXPORTÉ

ENRICHMENT CONTRACT/CONTRAT D'ENRICHISSEMENT

COUNTRY CONTROL NUMBER
Nº DE CONTROLE DU PAYS

___ ___ ___ ___

RECEIVERS DECLARATION/DÉCLARATION DU DESTINATAIRE

SHIPPERS WEIGHTS ACCEPTED / POIDS DE L'EXPÉDITEUR ACCEPTÉ	
MEASURED UPON RECEIPT / CONTRÔLÉ SUR RÉCEPTION	
SUBJECT TO VERIFICATION / SUJET À VÉRIFICATION	

APPENDIX B

MONTHLY SUMMARY REPORT FORMAT

Monthly Summary Report

For Period From ____ To _____

Licensee _____ MBA _____

Material _____ Units _____

Transfer Identification					Receipts		Shipments		Balance		
From	To	Date Shipped \ Received	Transfer Number	Revision Number	Element Weight	Isotope Weight	Element Weight	Isotope Weight	Element Weight	Isotope Weight	W%

APPENDIX C

REPORTING IDENTIFICATION SYMBOL (RIS) DIRECTORY

FOR

MATERIAL BALANCE AREAS (MBA)
MINE/MILL FACILITIES
UNACCOUNTABLE GAINS AND LOSSES (SLU)
COUNTRIES

MATERIAL BALANCE AREAS (MBA)

AA ..... Darlington G.S. "A"
A1 ..... AECL, Chalk River, NMC, HEU, Pu, ^{233}U
A2 ..... AECL, Chalk River, NMC, LEU, NU, DU, Th
B1 ..... AECL, Chalk River, N.R.X. Reactor
BN ..... Gentilly 2 G.S.
C ..... AECL, Chalk River, N.R.U. Reactor
CN*..... Point Lepreau G.S.
DA ..... AECL, Chalk River, Waste Management
D1 ..... AECL, Chalk River, Workshops, Estimating & Planning, Bldg. 429B
D2 ..... AECL, Chalk River, Metallurgy
D3 ..... AECL, Chalk River, Workshops, Estimating & Planning, Bldg. 429
D4 ..... AECL, Chalk River, Chemical Operations
E1 ..... AECL, Chalk River, Health Sciences
E2 ..... AECL, Chalk River, Chemistry
E3 ..... AECL, Chalk River, Physics
E4 ..... AECL, Chalk River, Advanced Projects & Reactor Physics
E5 ..... AECL, Chalk River, Fuel Engineering
E6 ..... AECL, Chalk River, Workshops, Estimating & Planning, Bldg. 466
FA ..... Eldorado Resources Limited, Port Hope, natural UO_2
FB ..... Eldorado Resources Limited, Port Hope, natural scrap UO_2
FC ..... Eldorado Resources Limited, Port Hope, natural UF_6
FD ..... Eldorado Resources Limited, Port Hope, natural metal
FE ..... Eldorado Resources Limited, Port Hope, depleted U metal and other
FF ..... Eldorado Resources Limited, Port Hope, depleted UF_6
FG ..... Eldorado Resources Limited, Port Hope, LEU
G1 ..... Zircatec Precision Industries Inc., Port Hope, natural, depleted uranium
G2 ..... Zircatec Precision Industries Inc., Port Hope, LEU, Th/U
H ..... General Electric Canada Inc., Toronto
I ..... General Electric Canada Inc., Peterborough
K ..... Bruce G.S. "A"
BK ..... Bruce G.S. "B"
M ..... Pickering G.S.
N ..... Gentilly 1 G.S.
O ..... Douglas Point G.S.
P ..... AECL, Whiteshell N.R.E.
Q* ..... McMaster University
R ..... University of Toronto
S ..... AECL Radiochemical Co.
T ..... Dalhousie University
U* ..... Saskatchewan Research Council
W* ..... University of Alberta
X* ..... Royal Military College (RMC), Kingston
Y6 ..... Ecole Polytechnique
ZA ..... Zircatec Precision Industries Inc., Hamilton, Ontario
ZB ..... Stern Laboratories Inc., Hamilton, Ontario
ZC ..... AECL Engineering Co., Mississauga, Ontario
ZD ..... Leavens Aviation Inc., Malton, Ontario
ZE ..... Ontario Hydro Research Division, 800 Kipling Ave., Toronto, Ontario
ZF ..... Eldorado Resources Limited, Ottawa, Ontario
ZG ..... Department of National Defence, Ottawa, Ontario
ZH ..... Defence Research Establishment, Val-Cartier, Quebec

ZI ..... Vac-Aero International, Oakville, Ontario
ZJ ..... University of British Columbia, Vancouver, B.C.
ZK ..... University of Western Ontario, London, Ontario
ZL ..... Don Lee Nuclear, Oakville, Ontario
ZM ..... LaPrade Heavy Water Plant, Gentilly, Quebec
ZN ..... Quebec Tool Corp., St-Lambert, Quebec
ZO ..... Triodem Technical Services Mississauga, Ontario
ZP ..... Carleton University, Ottawa, Ontario
ZQ ..... Canadair, St. Laurent, Quebec
ZR ..... Pneumat-A-Ray Products, Edmonton, Alberta
ZS ..... Electrofuel Mfg. Co., Toronto, Ontario
ZT ..... E.S. Fox Ltd., Niagara Falls, Ontario
ZU ..... Ontario Research Foundation, Mississauga, Ontario
ZV ..... University of Manitoba, Winnipeg, Manitoba
ZW ..... York University, North York, Ontario

MINE/MILL FACILITIES

DAL .... Agnew Lake Mine Limited
DAM .... Amok Limited/Cluff Mining
DAY .... Eldorado Resources Limited, Port Hope
DBR .... Eldorado Resources Limited, Blind River
DCS .... Denison Mines Limited
DDD .... Madawaska Mines Limited
DEO .... Eldorado Research and Development,Ottawa
DGM .... Gulf Minerals Canada Limited
DKL .... Key Lake Mines Limited
DNN .... Beaverlodge Mines - Eldorado Resources Limited
DRA .... Rio Algom Limited
DSG .... Sherrit Gordon
DUR .... Uranerz Canada Limited
DUS .... Uranerz Exploration and Mining
DWN .... Witteck Development Inc.
ESI .... ESI Resources Limited

UNACCOUNTABLE GAINS AND LOSSES

SLU .... Unaccountable gain or loss

COUNTRIES

AF ..... Afghanistan
AL ..... Albania
DZ ..... Algeria
AB ..... Antigua & Barbuda
RA ..... Argentina
AS ..... Australia
AU ..... Austria
BA ..... Bahamas
BH ..... Bahrain
BD ..... Bangladesh
BB ..... Barbados
BL ..... Belgium
BE ..... Benin
BT ..... Bhutan
BO ..... Bolivia
RB ..... Botswana
BR ..... Brazil
BG ..... Bulgaria
BU ..... Burma
RU ..... Burundi
BY ..... Byelo-Russian S.S.R.
TC ..... Cameroon, United Republic of
CN ..... Canada
CV ..... Cape Verde
CA ..... Central African Republic
CD ..... Chad
CE ..... Chile
X ..... China, People's Republic of
TW ..... China, Republic of (Taiwan)
CO ..... Columbia
CB ..... Congo, People's Republic of
CR ..... Costa Rica
CU ..... Cuba
CY ..... Cyprus
CS ..... Czechoslovakia
KR ..... Democratic Kampuchea
AN ..... Democratic Yemen
DK ..... Denmark
DO ..... Dominican Republic
W ..... EURATOM
EC ..... Ecuador
ET ..... Egypt
SV ..... El Salvador
GE ..... Equatorial Guinea
EP ..... Ethiopia
IF ..... Fiji
SF ..... Finland
F ..... France
GA ..... Gabon
GM ..... Gambia
DD ..... German Democratic Republic
DF ..... Germany, Federal Republic of

GH ..... Ghana
GR ..... Greece
GD ..... Grenada
GT ..... Guatemala
GN ..... Guinea
GI ..... Guinea-Bissau
GU ..... Guyana
RH ..... Haiti
HS ..... Holy See
HO ..... Honduras
HU ..... Hungary
IA ..... IAEA
IS ..... Iceland
IN ..... India
RI ..... Indonesia
IR ..... Iran Islamic Republic
IQ ..... Iraq
ID ..... Ireland
IL ..... Israel
IT ..... Italy
CI ..... Ivory Coast
AJ ..... Jamaica
J ..... Japan
HJ ..... Jordan
KN ..... Kenya
KD ..... Korea, Dem. People's Republic of
KO ..... Korea, Republic of
KW ..... Kuwait
LA ..... Lao People's Democratic Republic
RL ..... Lebanon
LS ..... Lesotho
LB ..... Liberia
LI ..... Libyan Arab Jamahiriya
LN ..... Liechtenstein
LX ..... Luxembourg
RM ..... Madagascar
MW ..... Malawi
MY ..... Malaysia
MD ..... Maldives
ML ..... Mali
MT ..... Malta
MU ..... Mauritania
MS ..... Mauritius
MX ..... Mexico
MC ..... Monaco
MN ..... Mongolia
MA ..... Morocco
NM ..... Namibia
NU ..... Nauru
NP ..... Nepal
NL ..... Netherlands
NA ..... Netherlands Antilles and Surinam
NZ ..... New Zealand
NI ..... Nicaragua

NG ..... Niger
NF ..... Nigeria
NO ..... Norway
AO ..... Oman
PK ..... Pakistan
PA ..... Panama
PN ..... Papua, New Guinea
PY ..... Paraguay
PE ..... Peru
PI ..... Philippines
PL ..... Poland
PO ..... Portugal
SQ ..... Qatar
RO ..... Romania
RW ..... Rwanda
SS ..... Samoa
SM ..... San Marino
SA ..... Saudi Arabia
SE ..... Senegal
SL ..... Sierra Leone
SG ..... Singapore
SB ..... Solomon Islands
SO ..... Somalia
AZ ..... South Africa
ES ..... Spain
CL ..... Sri Lanka
SC ..... St. Lucia
SN ..... Sudan
SI ..... Surinam
SD ..... Swaziland
SW ..... Sweden
CH ..... Switzerland
SR ..... Syrian Arab Republic
TW ..... Taiwan
TA ..... Tanzania, United Republic of
TH ..... Thailand
TG ..... Togo
TO ..... Tonga
TT ..... Trinidad and Tobago
TN ..... Tunisia
TR ..... Turkey
TU ..... Tuvalu
U ..... USA
Z ..... USSR
EU ..... Uganda
UR ..... Ukrainian S.S.R.
AE ..... United Arab Emirates
Q ..... United Kingdom of Great Britain and Northern Ireland
HV ..... Upper Volta
GY ..... Uruguay
NV ..... Venezuela
RV ..... Viet-Nam, Socialist Republic of
NY ..... Yemen Arab Republic
IU ..... Yugoslavia

CK ..... Zaire
RZ ..... Zambia
ZI ..... Zimbabwe (Rhodesia)